Organizational Culture and Big-Data: Building Civil-Military Collaboration During Disaster Management Operations in Pakistan

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Introduction

Disasters, as acts of natural chaos, create an imbalance that results in complexity for disaster management teams. They necessitate swift decision-making and resource management, with predictive analysis playing a crucial and irreplaceable role. This underscores the importance of preparedness and planning in disaster management operations, which require a high level of coordination among various government departments, each with its own organizational culture. The response and recovery mechanisms of most nations rely on the collaboration between civil and military institutions. Collaboration necessitates multi-directional resources to meet the challenges of disasters that a single organization cannot mitigate. This leads civil-military leadership and administration to use a collective space in a complex situation involving high decision-making standards. Thus, a mechanism is needed to improve ST (Swift Trust) amongst collaborators with a divergent organizational culture.

Scholars have enumerated various conditions and combinations necessary for collaborative performance (CP). Currently, CP is measured by scholars using different pathways, including institutional designs, incentives, and Big-Data analysis capability, as all these pathways tend to create an ST among organizations with divergent cultures. Different scholarly models present various viewpoints on collaborations, yet all seek to present conditions necessary for attaining CP (Douglas et al., 2020). Collaboration and coordination are the two terms most often interrelated. Coordination can be sharing data, plans, and situational awareness to achieve collaboration, which means working together to create something new (Dubey et al., 2019). Collaborations during national disasters are non-profit and usually hastily formed to react to the chaos. The significance of the created collaboration and the incentives each organization intends to bring into the project is empirically termed collaborative paradox. This paradox is affected by a mix of influences that generate the necessary impetus to get started with

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the project, and understanding it is crucial in managing the challenges of collaboration in disaster management.

Due to the high level of unpredictability and uncertainty, disaster management has attracted much attention among various disciplines for the importance of timely use of information for decision-making in disaster management. Gupta and colleagues (2019) argued that the maximum resources allocated for disaster management are wasted due to poor coordination because there is no platform for Big-Data analysis. Thus, the professional relationship between the organizations becomes adverse. To bring the temporary partners together in the initial stage of collaboration is a challenge, as is efficiently gathering, processing, analyzing, and disseminating relevant and timely information.

Furthermore, interdependence and the substantial perception of uncertainty about the collaborator's organizational behavior need ST to be formulated in the earliest phases (Schiffling et al., 2020; Qian et al., 2020). Big-Data analysis is needed in today's IT-centric operation environment to create ST and a control process throughout the collaborative tenure. The objective of the paper is to present a literature review for an organizational culture-based model where two divergent organizational cultures formed the ST for collaboration during disaster management operations.

Collaborative Dynamics in Disaster Management Operations

The recent research published in AMJ by Slade et al. (2020) suggested future research on collaborators with formal and informal organizational culture in a contextual environment where formal culture organization has a more salient role in the collaboration. More so, (Prakash et al., 2020) presented complexity theory as a potential research area to study disaster management. Nevertheless, few studies have been conducted on chaos, complexity theory, and CP.

Underpinning Theory

R.D. Stacey, the guru for chaos and complexity theory, used this theory to present practical insight and strategic planning to organizational management with an approach to avoid complacency. To elaborate on Stacey`s stance, Ortegón-Monroy (2003) discussed Chaos and complexity Theory to ascribe a paradoxical role to the managers in a framework to think and develop their responses. Features like unpredictability and non-linearity, mutual interaction and dependence, self-organization, and co-evolution characterize chaos and complexity.

According to Klijn (2008), the concept of self-organization can also be found in CP. This means that actors can share specific frameworks of action for interaction, collaboration, and goal achievement and how different decision-making processes influence each other.

Complexity theory analyzes the multiple layers of the system with separate analysis and a methodological framework that describes the interplay between these different layers, that is, co-evolution. Mbengue et al. (2018) concluded that defining such systems has created complexity theory, which collects and analyzes data at different collaborators levels and becomes a practical discipline for mixed methods research.

Swift Trust Among Collaborators

McLaren and Loosemore (2019, p. 981) defined ST as "a unique form of collective perception and relating capable of managing issues of vulnerability, uncertainty, risk, and expectations." Hastily formed networks may not have time to develop and maintain

trust through the traditional activities of familiarity, shared experience, and fulfilled promises. Instead, hastily formed networks, such as humanitarian relief operations, must formulate trusting relationships quickly, a concept termed ST. ST has also been considered in the context of unexpected and dangerous situations, for example, terrorist attacks, avalanches, explosive fires, or mass casualties in road traffic accidents, as those first on the scene in these instances are often strangers who have never worked together before (Schiffling et al., 2020)

Organizational Culture — (Formal & informal)

According to Dubey et al. (2019), organizational culture is a collection of shared assumptions, values, and beliefs reflected in its practices and goals and helps its members understand the organizational functions. Dubey, Gunasekaran, and Papadopoulos (2019) further argue that organizational culture affects how the firm responds to external events and makes strategic choices. Formal institutions are rules readily observable regarding positions, such as authority or ownership. Whereas formal institutions define the 'normative system designed by management' or a 'blueprint for behavior,' informal institutions define the actual behavior of players (Wang et al., 2018).

Mbengue et al. (2018) explained that collaborators also face problems of predominant hierarchies, which create a strong culture of thinking hierarchically, whereas the problems are primarily horizontal. The same is reflected during a crisis wherein management does away with authoritative or competitive strategies before finally turning to collaboration. There is thus a need to find a mechanism to improve ST amongst such collaborators who have a divergent organizational culture.

Big-Data Analysis

During collaborations, decision-making officials must manage conflicting sensitivities and interests and eliminate hostile positions and arguments for resources and information, transforming organizational goals into collective goals. An effective decision-making process requires an adequate environment to harmonize the subjectivities, uncertainty, and inaccuracy that are always present (Mbengue et al., 2018).

Using Big-Data analysis in an organization increases the ST and CP of the employees, along with improving management. (Dubey, et al., 2019).The impact of Big-Data analytic capabilities on organizational culture will further enhance ST's value in civil-military disaster management organizations (Kerdpitak et al., 2019). However, a holistic organizational culture is also a prerequisite to acquiring benefits from Big Data Analytics (BDA). Akter and Wamba (2019) argue that BDA provides all possible solutions to understand any disaster-related issues, while the results from the analysis may assist in optimally deploying the limited resources.

Analysis of Chaos and Complexity in Disaster Management

Chaos and complexity theory demonstrate that a sudden or non-linear change in the system can produce unexpected results for management and administration. Its main features include explaining 'butterfly/puller' sensitivity, mutual interaction, and dependence under non-linear and unpredictable problems (Ozturk et al., 2017). The present study attempts to apply chaos and complexity theory to the study of CP.

To achieve such mutually congruent objectives, military and civilian actors have to be able to form temporarily viable structures that support or enhance inter-organizational cooperation. Such civil-military structures are, though, extremely

complex, with the complexity being induced by, inter alia, the different tasks that need to be performed, differing degrees of time pressure and levels of interdependency between civilian and military co-workers; the non-routine nature of the tasks and their perceived importance; the dynamic context; differing operating cultures, views on leadership, and decision-making processes; and the amount of autonomy available at an operational level (Tatham & Rietjens, 2016).

The management involved in disaster control operations faces the complexity created by the chaos, which is non-linear. Complex problems require an approach that can play around rather than fight against the non-linear attributes of the issue. Joosse and Teisman (2020) presented complexification in management by arguing that complexity is somewhat the management gets actively involved in order to manage complex issues, wherein they do not involve policies as a process of change but rather adopt an interpersonal process of increasing trust and awareness within the newly formed teams. Given the growing attention in management studies on collaborative governance networks and complex service delivery, some of the ideas from complexity theories seem to be very pertinent. For example, the concept of dynamics offers a different perspective on the decision and interaction patterns in governance networks. Also, it generates insights into how complex integrated service delivery can be governed (Klijn, 2008).

Chaos theory has long been affiliated with applied sciences and mathematical equations. According to Begun (1994), researchers studying organizational studies mainly explain and deal with simple and balanced systems, whereas the practitioners, on the other hand, who are the administration officials, are usually committed to complex and chaotic situations. While disaster management operations revolve around civil-military collaboration, it is imperative to highlight that the politics of these relations are as prehistoric as Roman and Greek and are still contemporary (Feaver, 2017).

Therefore, the development of ST among civil-military collaborators in the initial stages is a requirement that is expected to be less in countries where the military has a more influential character and societal prominence (Kalkman et al., 2019). Pakistan is also a country where civil-military collaboration has much apparent cultural friction. However, recent pandemics of COVID and Locust attacks were well handled by NDMA using joint operations. The apparent reason seems to be the information sharing and predictive analysis using BDA.

Prospective Research Avenues

NCOC & NLCC presented a viable working relationship model for civil and military organizations in Pakistan collaborating at the NDMA platform. Systematic Literature Review of Dubey et al. (2019), Prakash et al. (2020), Gupta et al. (2019), Akter and Wamba (2019), Gazley et al. (2020), Modgil et al. (2020), Kamble and Gunasekaran (2020) also present avenues in research to deliberate upon the moderating role of BDA and on the relationship of ST and CP during disaster management in both Formal and informal Organizational culture.

Conclusion

This study presents the inter-relational effect of BDA and ST on CP during disaster management through chaos and complexity theory for both Formal and informal Organizational cultures. The mediating effect of organizational culture on the relationship between ST and CP and the moderating effect of BDA on the relationship

between ST, organizational culture, and CP is presented in the resource of disaster management. This study shall also present to policymakers and administration officials the importance of Big-Data analysis capability for collaboration. It shall also highlight the importance of creating an ST for the military and civil leadership to achieve the desired collaboration results.

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